Proceedings American Concrete Institute

Volume 79 1982

From JOURNAL OF THE AMERICAN CONCRETE INSTITUTE, January through December 1982

progress through knowledge

American Concrete Institute, Detroit, Michigan

Board of direction

President: Peter Smith

Vice-presidents: Norman L. Scott Edward O. Pfrang

Directors:

W. Burr Bennett, Jr.	Jacob S. Grossman	Cesar Hernandez
William C. Black	John M. Hanson	Eugene D. Hill, Jr.
Eugene H. Boeke	Neil M. Hawkins	V. Mohan Malhotra
Peter D. Courtois	C. Raymond Hays	Robert E. Price

Past president board members

John F. McLaughlin	Charles J. Pankow	T. Z. Chastain

Executive director: George F. Leyh

Technical activities committee

T. E. Northup, Chairman
Samuel J. Henry, Secretary

W. Gene Corley	Francis J. Jacques	Ignacio Martin
Joseph A. Dobrowolski	James O. Jirsa	Thomas J. Pasko, Jr.
I. Leon Glassgold	V. Mohan Malhotra	Loring A. Wyllie, Jr.

About the Proceedings

The *Proceedings* of the American Concrete Institute appear first in the JOURNAL of the American Concrete Institute. In 1982, the ACI JOURNAL was published bimonthly, with the annual index published in the March-April 1983 issue. The *Proceedings* include technical papers, ACI committee reports, and abstracts to ACI separate publications. All technical material originating in the ACI *Proceedings* pages is indexed annually. By assembling the *Proceedings* pages, which are numbered consecutively January through December, with the title, contents, and index pages from the index issue, a complete volume is formed.

Copyright © 1982, 1983
American Concrete Institute
P.O. Box 19150, Redford Station
Detroit, Michigan 48219

Printed in United States of America

Proceedings of the American Concrete Institute appear first in copyrighted JOURNAL of the American Concrete Institute

All rights reserved including rights of reproduction and use in any form or by any means, including the making of copies by any photo process, or by any electronic or mechanical device, printed or written or oral, or recording for sound or visual reproduction or for use in any knowledge or retrieval system or device, unless permission in writing is obtained from the copyright proprietors.

The Institute is not responsible as a body for the statements and opinions advanced in its publications.

CONTENTS

Proceedings American Concrete Institute
VOLUME 79 1982

January-February 1982 JOURNAL

3 **Effect of reinforcing details on the shear resistance of anchor bolts under reversed cyclic loading,** by R. E. Klingner, J. A. Mendonca, and J. B. Malik
13 **Stress-strain behavior of concrete confined by overlapping hoops at low and high strain rates,** by B. D. Scott, R. Park, and M. J. N. Priestley
28 **Design of webs and web-flange connections in concrete beams under combined bending and shear,** by D. S. Prakash Rao
36 **Shear reinforcement at slab-column connections in a reinforced concrete flat plate structure,** by S. Unnikrishna Pillai, Wayne Kirk, and Leonard Scavuzzo
43 **Strength relationships for fly ash concrete,** by Sandor Popovics
50 **Roof and floor slabs assembled with precast concrete cored units,** by B. Venkateswarlu, Jeganathan Shanmugasundaram, and Vadivelu Shanmugam
56 **Prediction of deterioration of concrete due to freezing and thawing and to deicing chemical use,** by M. S. Zaman, P. Ridgway, and A. G. B. Ritchie
59 **Experimental study of beam-supported slabs under in-plane loading,** by Masayoshi Nakashima, Ti Huang, and Le-Wu Lu
66 **Abstracts**
Design handbook in accordance with the strength design method of ACI 317-77 — Volume 1, SP-17(81), 66
Significant developments in engineering practice and research: A tribute to Chester P. Siess, SP-72, 67

March-April 1982 JOURNAL

83 **Strength of embedded steel sections as brackets,** by Alan H. Mattock and G. H. Gaafar
94 **Safety and serviceability of thin-section structures,** by F. Bljuger
100 **Mortar constituent of concrete in compression,** by Ataullah Maher and David Darwin
110 **Explicit inelastic dynamic design procedure for aseismic structures,** by Mark Fintel and S. K. Ghosh
119 **Unified procedures for predicting the deflection and centroidal axis location of partially cracked nonprestressed and prestressed concrete members,** by Dan E. Branson and Heinrich Trost
131 **Steel fiber reinforced and plain concrete: Factors influencing flexural strength measurement,** by Colin D. Johnston
139 **Behavior of T-beam sections with varied shear reinforcement,** by Charles F. Scribner and Dale R. Wilhelm
147 **Analysis of various compliance criteria for compressive strength of concrete,** by M. Said Taryal
154 **Response of medium-rise frame-tube model under static and dynamic actions,** by Adrian Pocanschi and Ioan Olariu
160 **Abstracts**
Dynamic modeling of concrete structures, SP-73, 160

May-June 1982 JOURNAL

171 **Case study of aseismic design of a 16 story coupled wall structure using inelastic dynamic analysis,** by Mark Fintel and S. K. Ghosh
180 **Performance of high alumina cement concrete stored in water and dry heat at 25, 35, and 50 C** (digest), by D. H. H. Quon and V. M. Malhotra
184 **Behavior and strength of reinforced concrete beams in shear,** by S. Y. Debaiky and E. I. Elniema

195 **Measurement of tensile strength of concrete at very low temperatures,** by Manuel Elices and Jaime Planas
201 **Shear strength of deep beams,** by K. N. Smith and A. S. Vantsiotis
214 **Re-examination of the relation between splitting tensile and compressive strength of normal weight concrete,** by Nicholas J. Carino and H. S. Lew
220 **Limit analysis of internally pressurized cut-and-cover type underground reactor containments,** by O. Mahrenholtz, D. V. Reddy, and W. Bobby
226 **Abstracts**
Joint sealing and bearing systems for concrete structures, SP-70, 226

July-August 1982 JOURNAL

251 **Effect of pore water pressure on the strength of concrete subjected to impact loading and temperature gradients,** by Sven Sahlin and Kenneth Runesson
257 **Ductility in earthquake resisting squat shearwalls,** by T. Paulay, M. J. N. Priestley, and A. J. Synge
270 **Tensile capacity of short anchor bolts and welded studs: A literature review,** by R. E. Klingner and J. A. Mendonca
280 **Deep beam test results compared with present building code models,** by K. N. Smith and A. S. Vantsiotis
288 **Fracture toughness of fiber reinforced sulfur concrete,** by J. L. K. Ho and R. T. Woodhams
296 **A comparative study of confinement models,** by Shamim A. Sheikh
307 **Durability of concrete containing hollow plastic microspheres,** by Celik Ozyildirim and Michael M. Sprinkel
313 **Full-scale bearing strength investigation of thin wall-ribbed reinforced concrete panels,** by Z. A. Zielinski, M. S. Troitsky, and H. Christodoulou
322 **Fiber reinforced methacrylate polymer concrete,** by Thomas W. Brockenbrough and Donald N. Patterson

September-October 1982 JOURNAL

339 **Shear capacity of short anchor bolts and welded studs: A literature review,** by R. E. Klingner and J. A. Mendonca
350 **Air contained in superplasticized concretes,** by Giampietro Tognon and Stefano Cangiano
355 **Behavior of reinforced concrete lapped splices for inelastic cyclic loading,** by K. Lukose, P. Gergely, and R. N. White
366 **Bonding and corrosion protection properties of two coatings for prestressing steels,** by Fernand Ellyin and Rafik A. Matta
372 **Control of beam deflections by allowable span-depth ratios,** by B. Vijaya Rangan
378 **Model of mechanism for naphthalene series water-reducing agent,** by Gu Dezhen, Xiong Dayu, and Lu Zhang
387 **Buckling of reinforced concrete cooling tower shells: BSS approach,** by Ihsan Mungan
392 **Punching shear behavior of reinforced slab-column connections made with steel fiber concrete,** by R. N. Swamy and S. A. R. Ali
407 **Abstracts**
Monolithic refractories, SP-74, 407
Fatigue of concrete structures, SP-75, 409

November-December 1982 JOURNAL

435 **Is the "staggering concept" of shear design safe?** by Thomas T. C. Hsu
444 **Hydration, structure, and properties of blast furnace slag cements, mortars, and concrete,** by D. M. Roy and G. M. Idorn
458 **Lapped splices in earthquake-resisting columns,** by Thomas Paulay
470 **Shear strength of pipe, box sections, and other one-way flexural members,** by Frank J. Heger and Timothy J. McGrath
484 **Stress-strain curves of concrete confined by spiral reinforcement,** by S. H. Ahmad and S. P. Shah
491 **Abstracts**
Designing for creep and shrinkage in concrete structures, SP-76, 491
George Verbeck symposium on sulfate resistance of concrete, SP-77, 494
509 **Index to Proceedings V. 79**